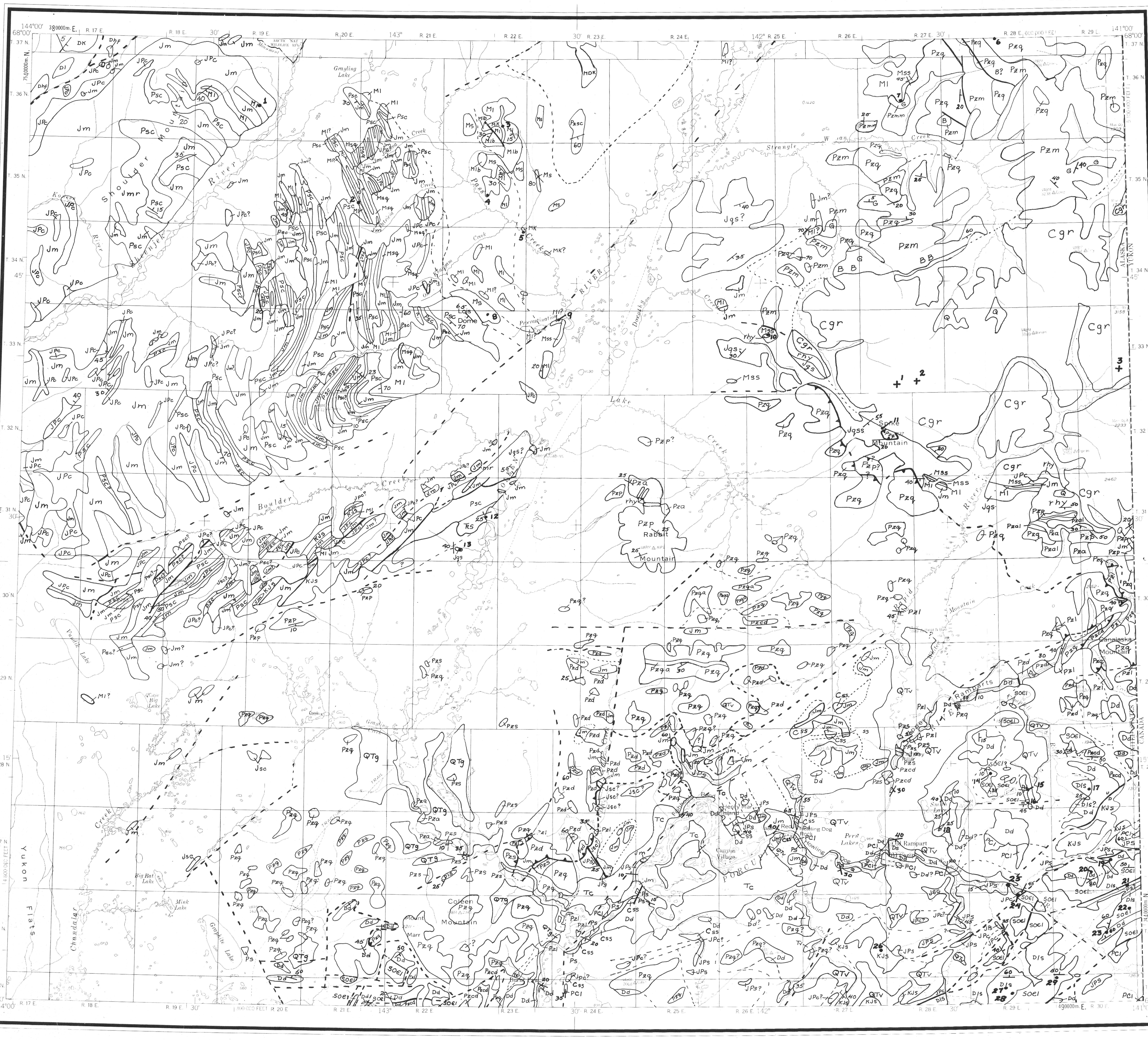
UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

COLEEN

ALASKA
TOPOGRAPHIC SERIES

U.S. GEOLOGICAL SURVEY
OPEN FILE MAP



SCALE 1:250 000

CONTOUR INTERVAL 200 FEET
DATUM IS MEAN SEA LEVEL

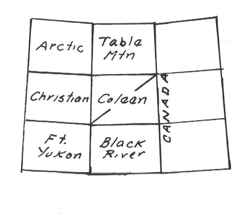
Geology by:

W.P. Brosgé and H.N. Reiser, 1963

W.P. Brosgé, H.N. Reiser, J.T. Dutro Jr. and Michael Churkin Jr., 1964

W.P. Brosgé and H.N. Reiser, 1967

Location Index



Preliminary geologic map of the Coleen quadrangle, Alaska

by W.P. Brosgé and H.N. Reiser

1969

THIS MAP IS PRELIMINARY AND HAS NOT BEEN EDITED OR REVIEWED FOR CONFORMITY WITH U.S. GEOLOGICAL SURVEY STANDARDS AND NOMENCLATURE

EXPLANATION

Sedimentary and volcanic deposits

Covered
Alluvium and residual soil, loess and low river terrace deposits

Christian River Sequence

KJs Sandstone
Gray and yellow fine to very fine grained quartz sandstone with conchoidal fracture; minor black fine grained sandstone, black siltstone and green chert.
Correlated lithologically with fossiliferous sandstone KJs of Porcupine R. Seq.
JURASSIC OR CRETACEOUS

Jsc Sandstone and chert
Gray to yellow very fine grained sandstone as in unit KJs; red argillite; green black, white chert
JURASSIC(?)

JPc Chert
Green, gray and red chert, argillite and shale
PERMIAN OR JURASSIC

Psc Shale and chert
Black silt and clay shale; red and green argillite; red, green and black chert; fine grained pyritic calcareous sandstone with minor amount K-spar. Sandy to silty pyritic limestone with crinoid fragments, mainly in upper part of unit. One possible conodont of Permian or Triassic age in red argillite. May be as much as 2000 ft thick
PERMIAN(?)

Ml Lisburne Group
Gray cherty bioclastic limestone, dark gray fine grained laminated limestone and black laminated chert. Contains brachiopods, bryozoans and Upper Mississippian foraminifera. About 100 ft thick
MISSISSIPPIAN

Msq Shale and quartzite
Black silty shale and black chert; light gray very fine to fine grained laminated sandstone. Less than 500 ft thick
MISSISSIPPIAN(?)

Brooks Range Sequence

Ml / Mlb Lisburne Group
Gray fine to medium grained, partly crinoidal limestone with black chert. Mlb; brown weathering fine grained limestone.
Contains Upper Mississippian corals. Overlain north of quadrangle by shale with Pennsylvanian goniatites and Permian snails 10 mi. north of Grayling Lake

MK Kayak Shale
Black shale, black laminated siltstone and chert; orange weathering crinoidal limestone. Contains brachiopods of Early and Late(?) Mississippian age. About 500 ft thick

Ms Siltstone
Black, laminated, silicified siltstone; chert; black shaly phosphatic limestone with horn corals. Silicified crinoidal limestone with Carboniferous or Permian bryozoans in upper part of unit. Brachiopods of Late(?) Mississippian age in black siltstone north of Bear Mtn, 35 mi. north of quadrangle. About 1200 ft thick
MISSISSIPPIAN

MDK Kekiktuk or Kanayut Conglomerate
Quartz-chert pebble conglomerate and sandstone
DEVONIAN OR MISSISSIPPIAN

UNCONFORMITY

DK Kanayut Conglomerate
Light gray to yellow fine to medium grained quartzite and quartz-chert pebble conglomerate; greenish gray very fine grained thin bedded sandstone. Pyrophyllite in conglomerate 2 miles north of quadrangle

Dhf Hunt Fork Shale
Dark gray clay shale; very fine to fine grained thin-bedded sandstone and quartzite
DEVONIAN

Dl Limestone
Black fine grained thin bedded slaty limestone
DEVONIAN(?)

Pzsc Schistose Sandstone
Ferruginous coarse grained quartz sandstone and conglomerate; minor green calcareous sandstone
PALEOZOIC(?)

Strangle Woman Creek Sequence

Jqs Quartzite and shale
Dark gray shale and siltstone; dark gray very fine grained quartzite; sandstone to granule conglomerate. Minor gray and green sandstone. Lower Jurassic ammonites in dark sandstone
JURASSIC

℞s Shublik Formation
Black, partly calcareous shale; gray, very fine grained thick bedded quartz sandstone; olive gray very fine grained silty limestone. *Monotis* of Late Triassic age in sandstone and limestone. About 500 ft thick
TRIASSIC

Jqss Quartzite, Shale and sandstone, undifferentiated. Units Mss and Jqs

Psc Shale and chert
Gray, red and green chert, argillite and shale; calcareous graywacke with minor K-spar. Includes 10 to 25 ft of cherty limestone possibly equivalent to unit Ml.
PERMIAN(?)

Ml Lisburne Group
Gray limestone and dolomite. Lower part is dark gray hematitic very fine grained thin bedded limestone with black chert. Basal beds locally sandy. Upper Mississippian corals in lower hematitic beds. At least 1000 ft thick

Mss Sandstone
Coarse grained conglomeratic quartz sandstone with minor K-spar. Cement is carbonate, silica, hematite. Contains Late Paleozoic brachiopods. As much as 300 ft thick
MISSISSIPPIAN

UNCONFORMITY

Pza / Pzal Argillite
Red, green and orange partly calcareous slate and argillite; thin beds of micaceous limestone and calcareous sandstone; minor greenstone
Pzal, Gray fine grained thin bedded ferruginous silty limestone; minor calcareous argillite

Pzp Phyllite
Laminated dark gray, light gray and greenish gray clay and silt phyllite; minor very fine grained, thin bedded sandstone
PALEOZOIC(?)

Pzq Quartzite
Light gray to pale orange, fine to very fine grained orthoquartzite, partly limonitic, locally micaceous. Minor schistose ferruginous siltstone and greenish gray silt shale
Paleozoic snail in float probably from this unit

Pzm / Pzmm Metamorphic rocks
Semischist and phyllite, dark gray, micaceous, silty, and gray to greenish gray very fine grained quartzose. Some laminated phyllite. Includes thin layers of greenstone. B, biotite schist and phyllite. G, garnet schist and quartzite
Pzmm, greenstone
LOWER PALEOZOIC

Porcupine River Sequence

QTv Volcanic rocks
Vesicular to massive olivine basalt flows. As much as 300 ft thick

QTg High terrace gravel
Quartz-chert pebble gravel, shale chip gravel in clay matrix; minor rhyolitic tuff; petrified wood
TERTIARY OR QUATERNARY

Tc Clay
Pebbly clay, lignite, minor tuff and ironstone. Contains clams of Miocene(?) age
TERTIARY

KJs Sandstone
Gray, ferruginous, very fine to fine grained sandstone; carbonaceous films. About 500 ft exposed. Contains clams of Jurassic or Cretaceous age
JURASSIC OR CRETACEOUS

UNCONFORMITY

JPc Chert
Thick beds of gray chert breccia; minor very fine grained limonitic sandstone. May in part be silicified dolomite breccia. At least 200 ft thick
PERMIAN OR JURASSIC

JPs / Ps Shale and siltstone
Gray to black siltstone and silty shale; siltstone nodules; pyritic. About 1000 ft thick. Contains Lower Jurassic ammonites in upper part.
Ps, Gray nodular siltstone and yellow weathering silty limestone with Permian brachiopods. At least 400 ft thick +●
PERMIAN AND JURASSIC

Jsc Sandstone and chert
Red and green laminated chert, partly silicified siltstone and shale; ferruginous very fine grained sandstone
JURASSIC(?)

PCl Limestone
Gray cherty limestone; dark gray shaly limestone and chert. Local basal shale and sandstone may be equivalent to unit Css. About 200 to 600 ft thick. +●
CARBONIFEROUS AND PERMIAN

Css Sandstone
Yellow, coarse grained conglomeratic poorly sorted, partly carbonaceous sandstone; fine grained hematitic sandstone. As much as 200 ft thick ●
CARBONIFEROUS

UNCONFORMITY

Dls Limestone
Dark gray, fine grained limestone; minor dark gray dolomite and coarse grained limestone. Contains Middle Devonian corals; coral of Late Devonian age on Rat Creek 3½ mi. south of quadrangle

Dd Dolomite and limestone
Dark gray fine to medium grained dolomite with some black chert and *Amphipora* (?); light gray limey dolomite and limestone; yellow and gray very fine grained laminated dolomite and chert with minor red and green shale and sandstone. About 1000 ft thick ●□
DEVONIAN

UNCONFORMITY

Ds Salmontrout Limestone
Dark gray massive biohermal limestone with Lower Devonian tentaculitids. About 600 ft thick. Map unit also includes overlying Middle Devonian shale and underlying Upper Silurian shale ●□

SOEl Dolomite and limestone
Interbedded gray laminated to mottled limey dolomite, dark gray dolomite with minor black chert, light gray coarse grained dolomite, and light to dark gray calcilutite. Some light gray coral and limestone cobble conglomerate. Includes Silurian and Ordovician corals and snails, and Cambrian(?) trilobites. At least 2000 ft thick ●
CAMBRIAN(?), ORDOVICIAN AND SILURIAN

Pzd Fine grained dolomite
White, very fine to fine grained dolomite, partly laminated partly silicified. Some gray chert and jasper. Contains poorly preserved corals(?). Few beds dark dolomite with *Amphipora* (?)

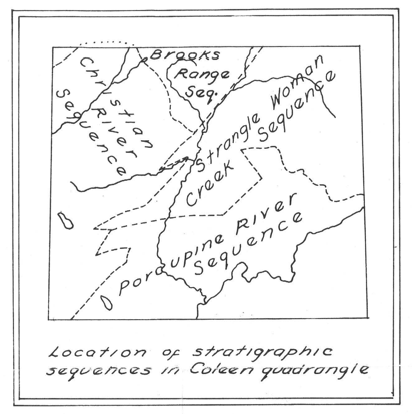
Pzcd Coarse grained dolomite
Light gray, medium to coarse grained massive vuggy dolomite

Pzl Limestone and shale
Black silty calcareous shale and black fine grained thin bedded limestone; brown siltstone; siltstone concretions; nodular cherty dolomite. About 400 ft thick ●

Pzq / Pzqa Quartzite
Light gray fine grained orthoquartzite; pyritic laminated quartzite, quartz siltstone and olive micaceous shale. At least 2000 ft thick ●

Pzs Shale and sandstone
Brown weathering dark gray silty micaceous shale and fine grained thin bedded pale yellow ferruginous manganiferous sandstone. Highly sheared on Coleen River. Stratigraphic position uncertain
PALEOZOIC(?)

For some details of stratigraphy see:
● Brosgé and others, 1966
□ Churkin and Brabb, 1967
+ Laudon and others, 1966



Location of stratigraphic sequences in Coleen quadrangle

Intrusive Rocks

Jm Mafic rocks
Gabbro, basalt and quartz-diorite sills, mainly in Christian River sequence. Includes some amygdaloidal flows and interbedded limestone-basalt cobble conglomerate on Porcupine River. Correlated with Jurassic mafic rocks of Christian quadrangle (Reiser and others, 1966)
JURASSIC

rhy Rhyolite
Sills peripheral to granite (Cgr) intrude rocks as young as Mississippian
UPPER PALEOZOIC(?)

Cgr Granite
Biotite granite and quartz monzonite with minor muscovite locally; partly porphyritic. Intrudes unit Pzm to north. Southern contact obscure; may be fault west of Spike Mountain. K/Ar age of mica: 295 to 335 m.y. (See table 2)
CARBONIFEROUS

Table 1, Fossil Collections

Map No.	Field Number	Dominant Fossils	Age	Map Unit	Identified by
1	67ABe86C	Foramenif.	Late Miss.	Ml	Armstrong
2	67ABe80B	"	Late Miss.	Ml	"
3	67ABe141	brachiopods	Late(?) Miss.	MK	Dutro
4	67ARr299	corals	Late Miss.	Ml	Armstrong
5	59ABeC14	brachiopods, corals	Early Miss.	MK	Dutro
6	67ABe297A (float)	brachiopod, snail	Paleozoic	Pzq	Dutro
7	67ABe308C	corals	Late Miss.	Ml	Armstrong
8	59ABeC8	bryozoans	Carb. or Perm.	Ms	Duncan
9	67ABe133	corals	Late(?) Miss.	Ml?	Armstrong
	Collected by J.E. Owens from bedrock in shaft				
10	67ABe196	brachiopods, bryozoans	Late(?) Paleozoic	Mss	Dutro
11	67ARr337	ammonites	Early Jurassic (Hettangian)	Mss and Jqs undiff.	Silberling Imlay
11	63ABe47B	ammonites	Mesozoic		Imlay
11	63ABe47A	brachiopods, corals	Carbonif. or Permian		Dutro Gordon
12	63ABe2	monotids	Late Triassic	℞s	Silberling
13	63ABe6	pectinoid palecypod	indeterminate	Jqs	"
14	67ARr433	trilobite	Cambrian(?)	SOEl	Ross
15	67ARr442	Amphipora?	Devonian(?)	Dd	Oliver
16	67ARr445	corals	Late(?) Ord.	SOEl	Oliver
17	67ARr464	corals	Middle(?) Dev.	Dls	Oliver
18	67ABe232	Amphipora?	Devonian(?)	Dd	Oliver
19	67ARr551	snail	Sil. or Dev.	Dd	Yochelson
20	67ARr552	Amphipora?	Devonian(?)	Dd	Oliver
21	67ABe369	corals	Middle Dev.	Dls	Oliver
22	67ABe367 67ABe367B	corals	Middle(?) or Late(?) Sil.	SOEl	Oliver
23	67ARr554	Amphipora?	Devonian(?)	Dd	Oliver
24	67ARr619A	corals	Penn.-Perm.	JPs	Armstrong
25	KP0688	ammonites	Lower Juras.	JPs	Imlay
	(float collected by B.P. Exploration Co. 1962)				
26	67ABe428B	clams	Juras. or Cret.	KJs	Imlay
27	67ABe418	corals	Devonian	Dls	Oliver
28	67ABe417E	corals	Silurian or Middle Dev.	Dls	Oliver
29	67ABe411	snail / Amphipora?	Ordovician(?) / Devonian(?)	SOEl	Yochelson / Oliver

Identification of fossils by: A.K. Armstrong, Helen Duncan, J.T. Dutro Jr., Mackenzie Gordon, R.W. Imlay, W.A. Oliver Jr., R.J. Ross Jr., N.J. Silberling, E.L. Yochelson, U.S. Geological Survey

Table 2, Potassium-argon ages of minerals in granite

Potassium analyses by Lois Schlocker
Argon analyses and age calculations by Jarel Von Essen

Map No.	Field Number	Mineral	Percent K2O	Ar^{40}_{rad} moles/gm	$Ar^{40}_{rad}/Ar^{40}_{total}$	Apparent age (millions of years)
1	67ARr 363	biotite	6.66, 6.63 } 6.64	3.3532×10^{-9}	0.82	314 ± 9
2	67ARR 361	muscovite	10.35, 10.32 } 10.34	5.6053×10^{-9}	0.96	335 ± 10
2	"	biotite	7.02, 6.93 } 6.98	3.3334×10^{-9}	0.88	299 ± 9
3	67ABe 210	biotite	7.22, 7.27 } 7.24	3.4229×10^{-9}	0.93	295 ± 9

K^{40} decay constants $\lambda_e = 0.585 \times 10^{-10}$ per year
$\lambda_\beta = 4.72 \times 10^{-10}$ per year

Abundance ratio: $K^{40}/K = 1.19 \times 10^{-4}$ atom per atom

For additional data on stratigraphy and fossils see:

Brosgé, W.P., Reiser, H.N., Dutro, J.T. Jr., and Churkin, Michael Jr., 1966, Geologic map and stratigraphic sections, Porcupine River Canyon, Alaska: U.S. Geol. Survey open-file report.

Churkin, Michael Jr., and Brabb, E.E., 1967, Devonian rocks of the Yukon-Porcupine area and their tectonic relation to other Devonian sequences in Alaska, in International Symposium on the Devonian System, Vol. II, Alberta Society of Petroleum Geologists, Calgary, Canada

Kindle, E.M., 1908, Geologic reconnaissance of the Porcupine Valley, Alaska: Geol. Soc. America Bull., v. 19, p. 315-338

Laudon, L.R., and others, 1966, Middle and late Paleozoic stratigraphy, Alaska-Yukon border area between Yukon and Porcupine Rivers: Am. Assoc. Petroleum Geologists Bull., v. 50, no. 9, p. 1868-1889

Reiser, H.N., Lanphere, M.A. and Brosgé, W.P. 1966, Jurassic age of a mafic igneous complex, Christian quadrangle, Alaska: U.S. Geol Survey Prof Paper 525-C, p. C68-C71

For interpretation of magnetic rocks see:

Brosgé, W.P., Brabb, E.E. and King, E.R., 1968, Geologic interpretation of reconnaissance aeromagnetic survey of northeastern Alaska: U.S. Geol Survey open-file report

Geologic contact
Dashed where inferred beneath cover or younger rocks

Fault
Dashed where inferred

Thrust Fault
Teeth on upper plate; dashed where inferred

50 Strike and dip of beds

Strike of vertical beds

• 6 Fossil locality

+ 2 K/Ar sample locality

B Biotite in metamorphic rocks

G Garnet in metamorphic rocks

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